MT MESSENGER BYPASS PROJECT: SUMMARY OF EVIDENCE OF BRUCE SYMMANS (GEOTECHNICAL MATTERS) FOR THE NZ TRANSPORT AGENCY

1. I joined the Project full time in February 2018, to lead the detailed design. While I was not involved directly in the MCA assessments or scoring process, I have subsequently reviewed geotechnical aspects of the MCA assessments, geotechnical reports as well as the supporting geotechnical investigations, ground models and proposed solutions.

2. I have led the ongoing geotechnical investigations and assessment of the Project in preparation for detailed design.

Geotechnical conditions and approach

3. The predominant geomorphologic features of the Project area that affect the Project route and other previously considered routes are:

    (a) Hill country consisting of narrow ridges with steeply sloping valley sides formed and eroded into soft rocks. The soft rocks are sandstones and siltstones of the Mt Messenger Formation.

    (b) Low lying infilled valley floors. The valley floors consist of up to 30m depth of relatively uniform soft to firm alluvial silts, with varying proportions of sand and clay sized particles.

4. I have reviewed the geotechnical inputs provided to the MCA of options (MCA1 and MCA2). I consider these inputs provided a good reflection of the geotechnical risks as were known at the time of the assessments.

5. I have specifically reviewed and undertaken my own analysis of an existing landslide that effects the existing SH3 as well as a previously considered online route option (Option Z). Some sections of this very large landslide are currently actively displacing.

6. Without significant works to stabilise this landslide feature, any route options crossing the feature could be subject to ongoing deformation and potentially large displacements if subjected to earthquake shaking. Without stabilisation, any routes crossing this feature would not meet the NZ Transport Agency's design requirements for new highways.

7. The proposed retaining wall solution to address this landslide feature (and associated cost estimate) developed during the MCA process is a fair representation of what would be required to provide a resilient route, that would also meet the design requirements as set out in the Transport Agency's Bridge Manual. Such works would require significant expenditure (priced at $112 million).

8. The Project alignment is a feasible route, from a geotechnical perspective.

9. I consider that the proposed Project can be constructed to provide a resilient section of highway.

10. Specific geotechnical issues affecting this route include:

    (a) stability of cut and fill slopes;

    (b) embankments on compressible ground; and

    (c) tunnel excavation and support.

11. These issues are not unusual for highway construction in New Zealand, and can be appropriately managed through appropriate detailed design and construction.

Response to NPDC Section 42A Report and discussions with NPDC geotechnical expert

12. In response to the NPDC Section 42A report the Alliance provided Mr Allison (NPDC geotechnical expert) with:

    (a) copies of a liquefaction assessment report for the Project; and

    (b) a monitoring report for a further round of displacement monitoring of the existing landslide feature below the existing Mt Messenger route.

13. As covered in my supplementary evidence, these reports conclude that the liquefaction risk to the project is low (due to cohesive nature of the soils) and the existing landslip feature has displaced noticeably (more than 50mm) since the last round of monitoring nine months earlier.

14. On 11 June 2018, myself and other members of the design team met with Mr Allison. At that meeting we talked through the Project, focussing on the geotechnical issues and challenges, and the geometric constraints that would prevent the 'Option Z' alignment being redirected around the existing landslide feature.

15. Mr Allison advised me at that meeting, and confirmed by email, that he was satisfied with the discussion and the information that we provided to him, and he required no further information or clarification.

Response to submitter evidence

16. As covered in my rebuttal evidence, in Mr Duirs' evidence he infers that erosion and sediment control devices constructed in the terrain of this Project present an increased risk of failure.

17. I consider this to be incorrect. All temporary earthworks for the Project including erosion and sediment control devices will be designed or reviewed by a geotechnical Engineer. The purpose of this is to ensure they are fit for purpose, safe and robust.

18. Erosion and sediment control devices will be geotechnically designed to address likely ground conditions, flood levels and the terrain of site.

19. The risk of failure of these engineered devices is extremely low.

20. In my opinion the proposed erosion and sediment control measures are practical from a stability and engineering perspective.